



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Eridin R. Sheffey	Project Number S1416
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Project Title
Ascertaining the Effect of Multiple Moons or No Moons on the Menstrual Cycle of Female Planetary Explorers

Abstract

Objectives/Goals
The menstrual of placental Mammals is speculated to be related to the gravitational effect of the moon. The moon is theorized to regulate the menstrual cycle and trigger ovulation, thus an important factor in human fertility. This project explores the issues facing female planetary scientists who explore the planets. If a female astronaut were on Mars with it's two moons, will she experience two menstrual cycles? If she were on Venus, which has no moons, would she not menstruate at all? Research on this topic is extremely limited, because no female astronaut has ever been outside the gravitational influence of the moon. This project used the "thought experiment" protocol to elicit from physicians and planetary scientists their ideas regarding the impact of planetary moons on the menstrual cycles of female astronauts, colonists and explorers. Rubrics were created, circulated and analyzed. Qualitative data was collected and analyzed.

Methods/Materials
This is one experiment that cannot be conducted on Earth, the Space Shuttle, or on the Moon because we only have one moon, and the female Shuttle astronauts are under the influence of the Moon. Therefore, I am using the "thought experiment" protocol to explore my hypotheses. In order to capture thoughts from physicians, a survey was created and distributed to several local physicians. The survey is comprised of three yes or no questions, and three open questions requesting comments and thoughts. The results were tabulated and the comments collected.

Results
The following are the results from the surveys:
First question: Yes=1; No=5
Second question: Pulling ions can increase menstrual cramps.
Third question: Yes=1; No=5
Fourth question: Can cause fluctuations of the hormone levels and cause breakthrough bleeding.
Fifth question: Yes=5; No=1
Sixth question: Decreases irregularities, decreases cramps.
Additional comments:
Excellent survey.
I feel internal clock of menses not affected by moons.

Conclusions/Discussion
Based on the results of the surveys, my hypotheses were disproven. All but one of the physicians indicated that the Moon and planetary satellites have no effect on the human female menstrual cycle.

Summary Statement
This project is about whether or not the human female menstrual cycle is affected by multiple moons or no moons when female astronauts explore other planets.

Help Received
Mentorship from Dr. Maureen Clemmons; Mother and Father for covering expenses; Dr. Stephen Chang, M.D. for resources; Kaiser Permanente's doctors for taking a survey.